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## LIST OF FIGURES

---

Figure 1-1 Location Map

Figure 1-2 Subreach Location Map

Figure 2.1-1 NAPL Investigation Locations

Figure 2.1-2 Sediment Sampling Locations

Figure 2.1-3 Riverbank Soil Sampling Locations

Figure 2.1-4 Geotechnical Boring Locations

Figure 2.1-5 Pore Water Sampling Locations

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## LIST OF TABLES

---

Table 1.3-1 EE/CA Reach Predesign Sampling Program Summary

Table 2.2-1 Summary of Oxbow NAPL Investigation Borings

Table 2.2-2 Summary of Oxbow Piezometer Observations

Table 2.2-3 Cobble Reach NAPL Investigation Summary

Table 2.2-4 Cobble Reach Piezometer Results

Table 2.2-5 Summary of Sediment NAPL Results, Location SE001291

Table 2.2-6 Summary of Aggrading Bar Sediment Data

Table 2.2-7 Summary of Subreach 4-4A Supplemental Sediment Data

Table 2.2-8 Summary of Non-Residential Deep Riverbank Soil Data

Table 2.2-9 Summary of Riverbank Soils Data from Previously Unaccessed Areas

Table 2.2-10 Summary of Pore Water Quality Results

Table 2.2-11 Seepage Meter Summary

Table 3.2-1 Volume Estimate for Aggrading Bars

# Tables

Table 1.3-1

## EE/CA Reach Predesign Sampling Program Summary

Task	Perf. By	Rationale/Placement	Frequency	No. of Locations	No. of Samples
<b>NAPL Investigation</b>					
Geoprobe Borings	GeoTek Engineering, Inc., Geo Logic, Inc.	Assess NAPL at base of bank, 10-ft depth max, continuous sampling, screening for NAPL w/ Sudan dye/shake test.	Every 50 ft along banks where former oxbows are located (2,200 ft both banks), every 25 ft where problems found (add 10 locations).	52	Field Screen
Piezometers	GeoTek Engineering, Inc., Geo Logic, Inc.	To monitor NAPL, install 1-inch PVC piezometer in suspect locations.	Up to 10 locations selected based on results of NAPL screening.	25	1
Hand-Dug NAPL Test Plots	WESTON	Identify locations where NAPL present, supplement existing information on NAPL location collected June 1999.	One every 50 ft along west bank, increase to one per 25 ft where NAPL identified. Two included upstream of Elm St. Bridge to account for NAPL present at Elm St. Bridge.	20	Field Screen
<b>Sediment Sampling</b>					
Aggrading Bars	GeoTek Engineering, Inc.	Assess PCB concentrations in aggrading bar, 12 aggrading bars located in non-cobble subreaches.	Two locations per aggrading bar, one located at highest point, one located halfway between highest point and farthest point on aggrading bar. Sample each location every 6 inches from 3- to 6-ft depth.	24	110
Appendix IX	GeoTek Engineering, Inc.	Sample sediment at locations where previous Appendix IX exceedance.	One, located at former sampling location SD021802, from 4 to 4.5 ft.	1	1
Subreach 4-4A	GeoTek Engineering, Inc.	Sample sediment from 1- to 2-ft and 2- to 3-ft depth intervals, no previous samples from these intervals.	Three locations (right, center, left) for every 50-ft transect, sample 1- to 1.5-ft and 2- to 2.5-ft depth at each location.	7	7
<b>Riverbank Soil Sampling</b>					
Center of Bank 3-6 ft (non-res)	WESTON	Sample middle bank location at non-residential areas, from 3- to 5.5-ft depth, every other 6 inches.	One location per transect at 27 transects, sample every other 6 inches 3 to 5.5 ft bgs.	59	187
Center of Bank 3-6 ft (APP IX Exceedance)	WESTON	Sample middle bank location where previous APP IX sampling showed exceedances.	One location per transect at one transect that had APP IX exceedance previously, sample 4 to 4.5 ft bgs.	4	4
Banks in Unaccessed Areas	WESTON	Sample banks at locations previously unaccessible, near Harry's Supermarket.	Three locations per transect at 9 transects, top, middle, and bottom of bank, sample 0 to 2.5 ft bgs top and bottom, 0 to 5.5 middle, every other 6 inches, APP IX 10% plus 1 sample at 4 to 4.5 ft bgs.	33	96
<b>Geotechnical Borings</b>					
Bank Borings	GeoTek Engineering, Inc.	Collect geotechnical information along both banks for bank stability and wall design purposes, to depth that is 20 ft below river bottom (25 to 50 ft bgs, depending on bank height), convert 10% to 2-inch monitor wells at suspect NAPL areas.	One boring every 500 ft along both banks, for entire 1.5-mile reach. Stagger borings from side to side. Sample every 5 ft or at changes in lithology, until elevation of river bottom reached, then every 10 ft.	31	150
River Borings	GeoTek Engineering, Inc.	Collect geotechnical information in the middle of the river for sheetpile design purposes, to 20 ft below river bottom, screen for NAPL at suspect areas.	One boring every 500 ft in center of river, along entire length of 1.5-mile reach except cobble reaches where previous information was collected. Offset borings from bank locations. Sample every 5 ft or at changes in lithology.	13	41
<b>Seepage Meters</b>					
Seepage Meters	WESTON	Place meters into sediment in river at groundwater discharge areas to gauge groundwater flux to river, analyze quantity of water generated and perform chemical analyses for purposes of water treatment system design.	Install 3 to 4 seepage meters in each reach.	9	9

**Table 2.2-1**

**Summary of Oxbow NAPL Investigation Borings**

<b>No.</b>	<b>Soil Boring ID</b>	<b>Date Completed</b>	<b>Total Depth of Boring</b>	<b>Well/Piezometer Installed?</b>	<b>Observations</b>
1	H2-BH000111	6/13/2000	10 ft	No	
2	H2-BH000113	6/15/2000	10 ft	No	
3	H2-BH000121	6/19/2000	12 ft	Yes	LNAPL. Screened 2 to 5 ft.
4	H2-BH000122	6/19/2000	10 ft	Yes	LNAPL. Screened 0 to 8 ft.
5	H2-BH000123	6/20/2000	10 ft	Yes	DNAPL odor, shake test inconclusive. LNAPL confirmed. Screened 0 to 5 ft.
6	H2-BH000155	7/12/2000	10 ft	No	Slightly off toe of slope due to rock debris.
7	H2-BH000156	7/12/2000	10 ft	No	
8	H2-BH000157	7/12/2000	10 ft	No	
9	H2-BH000158	7/12/2000	10.5 ft	No	
10	H2-BH000159	7/12/2000	10 ft	No	
11	H2-BH000160	7/12/2000	10 ft	No	
12	H2-BH000163	7/13/2000	10 ft	No	
	H2-BH000163A	7/13/2000	10 ft	No	
13	H2-BH000164	7/13/2000	10 ft	Yes	Screened from 5 to 7 ft. Hydrocarbon odor observed. No sheen observed during shake test.
14	H2-BH000165	7/13/2000	10 ft	Yes	Screened from 0 to 2 ft. Strong hydrocarbon odor decreasing with depth. No sheen in shake test. PID readings decrease downward.
15	H2-BH000166	7/13/2000	10 ft	No	Extremely light sheen in shake test.
16	H2-BH000167	7/13/2000	10 ft	No	Slight odor, no sheen or staining.
17	H2-BH000168	7/13/2000	10 ft	Yes	Screened from 0 to 2 ft. Mottled staining and odor observed at surface but no sheen.
18	H2-BH000169	7/13/2000	10 ft	Yes	Screened from 0 to 2 ft. Mottled staining and odor observed at surface but no sheen.
19	H2-BH000170	7/13/2000	10 ft	No	
20	H2-BH000171	7/14/2000	10 ft	Yes	Screened from 0 to 2 ft. Black staining from 0 to .5 ft. Hydrocarbon odor from 0 to 8 ft.
21	H2-BH000172	7/14/2000	10 ft		No staining, odor, or sheening observed.
22	H2-BH000173	7/14/2000	10 ft	No	Faint odor, no staining or sheening for 0 to 2 ft. Shake test negative.
23	H2-BH000174	7/14/2000	10 ft	No	Small amount of black mottling in top 4 inches. No odor below 1.5 ft. Very small amount of sheen from 0 to 4 ft.
24	H2-BH000175	7/14/2000	10 ft	No	No staining, odor, or sheening observed.
25	H2-BH000176	7/18/2000	10 ft	Yes	Former oxbow interface. No staining, sheen, or odor.
26	H2-BH000177	7/18/2000	10 ft	No	No staining, odor, or sheening observed.

Table 2.2-1

## Summary of Oxbow NAPL Investigation Borings

No.	Soil Boring ID	Date Completed	Total Depth of Boring	Well/Piezometer Installed?	Observations
27	H2-BH000178	7/18/2000	10 ft	Yes	No staining, odor, or sheening observed, shake test negative. Piezometer installed for coverage on east bank, screened 0 to 2 ft.
28	H2-BH000179	7/18/2000	10 ft	Yes	No staining or sheening observed. Faint odor observed, piezometer installed and screened from 0 to 2 ft.
29	H2-BH000180	7/19/2000	10 ft	Yes	Surface sheens observed during piezometer installation. Screened 0 to 2 ft.
30	H2-BH000181	7/19/2000	10 ft	No	No significant odor, staining, or sheens.
31	H2-BH000182	7/19/2000	10 ft	No	No significant odor, staining, or sheens.
32	H2-BH000183	7/19/2000	10 ft	No	No significant odor, staining, or sheens.
33	H2-BH000184	7/19/2000	10 ft	Yes	Faint odor; no staining or sheening for 0 to 2 ft. Shake test negative.
34	H2-BH000185	7/19/2000	10 ft	No	No sheen, staining, or odor.
35	H2-BH000186	7/20/2000	10 ft	Yes	Odor; no sheen or staining. Screened 0 to 2 ft.
36	H2-BH000187	7/20/2000	10 ft	No	
37	H2-BH000188	7/20/2000	10 ft	Yes	Faint odor. Location in former oxbow interface with river. Screened 0 to 2 ft.
38	H2-BH000189	7/20/2000	10 ft	Yes	
39	H2-BH000190	7/20/2000	10 ft	Yes	Screened 0 to 4 ft. Slight sheen observed at surface. Odor observed to 6 ft.
40	H2-BH000191	7/20/2000	10 ft	Yes	Screened 0 to 2 ft. Odor observed in 0- to 2-ft interval.
41	H2-BH000192	7/20/2000	10 ft	Yes	Screened 0 to 2 ft. Odor observed in 0- to 2-ft interval.
42	H2-BH000193	7/20/2000	10 ft	Yes	Screened 0 to 2 ft. Strong hydrocarbon odor and mottled staining at 0 to 1 ft and sheen.
43	H2-BH000194	7/20/2000	8 ft	No	No odor, staining, or NAPL.
44	H2-BH000195	7/20/2000	10 ft	No	No odor, staining, or NAPL.
45	H2-BH000196	7/20/2000	10 ft	No	No odor, staining, or NAPL.
46	H2-BH000197	7/20/2000	8 ft	No	No odor, staining, or NAPL.
47	H2-BH000198	7/20/2000	5 ft	Yes	Screened 0 to 2 ft. Shake test positive for sheen from 0 to 0.5 ft.
48	H2-BH000151	7/21/2000	7.5 ft	Yes	Screened 0 to 2 ft. Odor, possible staining, and slight sheen from 0 to 2 ft.
49	H2-BH000152	7/21/2000	6.5 ft	Yes	Screened 0 to 2 ft. Observed coal tar odor.
50	H2-BH000153	7/21/2000	3 ft	Yes	Screened 0 to 2 ft. Odor and sediment creates sheen when wet. Refusal at 3 ft.
51	H2-BH000154	7/21/2000	5.5 ft	Yes	Screened 0 to 5.5 ft. Significant stain, sheen, odor, but no NAPL.

**Table 2.2-2**

**Summary of Oxbow Piezometer Observations**

<b>Location ID</b>	<b>Date Installed</b>	<b>Location Description</b>	<b>Screened Interval (ft)</b>	<b>Bailer Observations 7/20/00</b>	<b>Bailer/Pump Observations 7/24/00</b>	<b>Pump Observations 8/3/00</b>
PZ-07 BH000164	7/13/2000	Slightly upstream of T072 west bank.	5-7	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-07 pumped with ISCO. No sheen in purge water, slight odor.
PZ-08 BH000165	7/13/2000	Slightly downstream of T072 west bank.	0-2	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-08 pumped with ISCO. No sheen in purge water.
PZ-09 BH000168	7/13/2000	Approximately 25 ft upstream of T074 west bank.	0-2	Oil/water probe negative for NAPL. Small sheen observed in purge water (10 volumes). No free phase, sheen in sediment portion of bailed water.	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-09 pumped with ISCO. Trace sheen in purge water.
PZ-10 BH000169	7/13/2000	Approximately 25 ft downstream of T074 west bank.	0-2	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-10 pumped with ISCO. No sheen in purge water.	Destroyed, possibly due to high water levels
PZ-11 BH000171	7/14/2000	Slightly upstream of T076 west bank.	0-2	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-11 pumped with ISCO. Trace sheen in purge water.
PZ-12 BH000176	7/18/2000	Between T078 and T081 west bank near Silver Lake outfall.	0-2	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-12 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-12 pumped with ISCO. No sheen in purge water.
PZ-13 BH000178	7/18/2000	Slightly upstream of T082 east bank.	0-2	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-13 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-13 pumped with ISCO. No sheen in purge water.

**Table 2.2-2****Summary of Oxbow Piezometer Observations**

<b>Location ID</b>	<b>Date Installed</b>	<b>Location Description</b>	<b>Screened Interval (ft)</b>	<b>Bailer Observations 7/20/00</b>	<b>Bailer/Pump Observations 7/24/00</b>	<b>Pump Observations 8/3/00</b>
PZ-14 BH000179	7/18/2000	Between T082 and T084 east bank.	0-2	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-14 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-14 pumped with ISCO. No sheen in purge water.
PZ-15 BH000180	7/19/2000	Between T076 and T078 east bank.	0-2	Oil/water probe negative for NAPL. Small sheen observed in purge water (10 volumes). No free phase, sheen in sediment portion of bailed water.	Oil/water probe negative for NAPL. PZ-15 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-15 pumped with ISCO. No sheen in purge water.
PZ-16 BH000184	7/19/2000	Between T080 and T082 west bank.	0-2	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-16 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-16 pumped with ISCO. No sheen in purge water.
PZ-17 BH000186	7/20/2000	Between T082 and T084 west bank.	0-2	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-17 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-17 pumped with ISCO. No sheen in purge water.
PZ-18 BH000188	7/20/2000	Between T084 and T086 west bank.	0-2	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-18 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-18 pumped with ISCO. No sheen in purge water.
PZ-19 BH000189	7/20/2000	Between T084 and T086 and east.	0-2	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-19 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-19 pumped with ISCO. No sheen in purge water.

**Table 2.2-2**

**Summary of Oxbow Piezometer Observations**

<b>Location ID</b>	<b>Date Installed</b>	<b>Location Description</b>	<b>Screened Interval (ft)</b>	<b>Bailer Observations 7/20/00</b>	<b>Bailer/Pump Observations 7/24/00</b>	<b>Pump Observations 8/3/00</b>
PZ-20 BH000190	7/20/2000	Slightly upstream of T086 west bank.	0-4	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-20 pumped with ISCO. Slight sheen in purge water, possibly biological.	Oil/water probe negative for NAPL. PZ-20 pumped with ISCO. No sheen in purge water.
PZ-21 BH000191	7/20/2000	Between T082 and T084 west bank, downstream of PZ-17.	0-2	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. PZ-21 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-21 pumped with ISCO. No sheen in purge water.
PZ-22 BH000192	7/20/2000	Between T086 and T088 west bank.	0-2	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. PZ-22 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-22 pumped with ISCO. No sheen in purge water.
PZ-23 BH000193	7/20/2000	Between T086 and T088 east bank.	0-2	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. PZ-23 pumped with ISCO. No sheen in purge water.	Oil/water probe negative for NAPL. PZ-23 pumped with ISCO. No sheen in purge water.
PZ-24 BH000198	7/20/2000	T092 east bank.	0-2	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. PZ-24 pumped with ISCO. Slight sheen during initial purge.	Oil/water probe negative for NAPL. PZ-24 pumped with ISCO. No sheen in purge water.
PZ-25 BH000123	7/21/2000	Slightly upstream of T070 west bank.	0-5	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. No sheen observed in purge water (15 volumes).	Oil/water probe negative for NAPL. PZ-25 pumped with ISCO. Slight sheen observed when sediment purged from PZ-25.
PZ-26 BH000122	7/21/2000	Slightly downstream of T068 west bank.	0-8	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-26 pumped with ISCO. No sheen in purge water.



**Table 2.2-2**

**Summary of Oxbow Piezometer Observations**

<b>Location ID</b>	<b>Date Installed</b>	<b>Location Description</b>	<b>Screened Interval (ft)</b>	<b>Bailer Observations 7/20/00</b>	<b>Bailer/Pump Observations 7/24/00</b>	<b>Pump Observations 8/3/00</b>
PZ-27 BH000121	7/21/2000	Slightly upstream of T068 west bank.	2-5	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. No sheen observed in purge water (10 volumes).	Oil/water probe negative for NAPL. PZ-27 pumped with ISCO. Slight sheen observed when sediment purged from PZ-27.
PZ-28 BH000154	7/21/2000	Downstream of T094 east bank.	0-5.5	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. PZ-28 pumped with ISCO. Trace sheen during purge.	Oil/water probe negative for NAPL. PZ-28 pumped with ISCO. Trace sheen during purge.
PZ-29 BH000153	7/21/2000	Slightly upstream of T096 east bank.	0-2	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. PZ-29 bailed and observed slight sheen. Pumped with ISCO and did not observe a sheen in purge water.	Oil/water probe negative for NAPL. PZ-29 pumped with ISCO. Trace sheen during purge.
PZ-30 BH000152	7/21/2000	Slightly upstream of T098 east bank.	0-2	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. PZ-30 pumped with ISCO. Slight biological sheen during purge. Coal tar odor nearby and floating spheres of coal tar noticed on water surface.	Oil/water probe negative for NAPL. PZ-30 pumped with ISCO. Trace sheen during purge and odor. Coal tar odor nearby and floating spheres of coal tar noticed on water surface.
PZ-31 BH000151	7/21/2000	Slightly upstream of T092 east bank.	0-2	Piezometer not installed as of the time of this monitoring event.	Oil/water probe negative for NAPL. PZ-31 pumped with ISCO. Slight biological sheen during purge.	Oil/water probe negative for NAPL. PZ-31 pumped with ISCO. Trace sheen during purge.

Table 2.2-3

## Cobble Reach NAPL Investigation Summary

Location ID	Date Installed	Location Description	Water Depth (ft)	Final Depth of Excavation (ft)	Rebar refusal (ft)	Sample ID	Shake/Dye Test	Observations
SE001280	5/31/2000	56 ft downstream T104	0.6	1.6	2.2	NA	No response	No sheen, strong odor.
SE001281	5/31/2000	61 ft downstream T106	0.5	1.6	1.9	NA	Sheen observed, Sudan IV dye slightly red	Stained sediment and slight sheen from 0.5 ft to 1.5 ft.
SE001282	5/31/2000	69 ft upstream T110	0.5	1.7	2.1	NA	No response	Slight sheen noticed.
SE001285	5/31/2000	37 ft upstream T112	0.2	1.2	1.8	NA	No response	No odor/sheen detected.
SE001286	5/31/2000	22 ft downstream T112	0.4	1.8	2.3	NA	Sudan IV slightly red	Sheen observed during excavation.
SE001287	5/31/2000	36 ft upstream T114	0.3	1.3	1.3	NA	Sudan IV slightly red	Slight sheen noticed.
SE001288	6/1/2000	T114	0.4	1.6	2	NA	No response	No sheen, large rocks encountered.
SE001290	6/1/2000	T116	0.4	2	2.2	NA	Sudan IV slightly red (0.6 ft to 1.6 ft)	Slight sheen noticed.
SE001291	6/1/2000	53 ft downstream T116	0.5	1.5	2.2	H2-SE001291-0-0015	Sudan IV bright red at 1.0 ft	Coal tar observed at 1.0 ft, large sheen, strong odor. Piezometer installed.
SE001299	6/1/2000	T124 (slightly upstream)	0.5	0.5	NE	NA	Sudan IV bright red (0 to 0.5 ft)	Geoprobe advanced 3 ft, recovery 0.6 ft, sample stained with oil.
SE001306	6/1/2000	15 ft upstream T132	0.3	0.5	NE	NA	Sudan IV bright red	Coal tar and heavy sheen observed. Piezometer installed.
SE001316	6/1/2000	T142	0.4	Not recorded	1.2	NA	Sudan IV bright red	Heavy sheen and staining observed during excavation.
SE001324	6/1/2000	T148	0.2	0.5	NE	NA	Sudan IV slightly red	Coal tar NAPL observed.
SE001325	6/1/2000	T150	NE	Not recorded	NE	NA	No response	NAPL observed.
SE001326	6/6/2000	T152	NE	2	NE	NA	No response	No sheen or NAPL observed.
SE001327	6/6/2000	T154	NE	1.5	NE	NA	No response	Slight sheen observed.
SE001328	6/6/2000	T156	NE	2	NE	NA	No response	Sheen observed, no NAPL noted.
SE001329	6/6/2000	T158	NE	2	NE	NA	No response	Small sheen observed, no odor.

**Table 2.2-3****Cobble Reach NAPL Investigation Summary**

<b>Location ID</b>	<b>Date Installed</b>	<b>Location Description</b>	<b>Water Depth (ft)</b>	<b>Final Depth of Excavation (ft)</b>	<b>Rebar refusal (ft)</b>	<b>Sample ID</b>	<b>Shake/Dye Test</b>	<b>Observations</b>
SE0001283	6/19/2000	T126 (east side)	NE	1.5	NE	NA	Sudan IV bright red	Strong product, sheen was very visible. Bank at T126 smelled like coal tar.
SE0001284	6/19/2000	T132 (east side)	NE	1.5	NE	NA	No response	No sheen, no NAPL noted.

Notes: All depths are in feet below the riverbed. Locations are on the west side of the river unless otherwise specified.

NE = Not encountered.

NA = Not applicable.

**Table 2.2-4**

**Cobble Reach Piezometer Results**

<b>Location ID</b>	<b>Date Installed</b>	<b>Location Description</b>	<b>Screened Interval (ft)</b>	<b>Geoprobe Boring and Piezometer Observations</b>	<b>Bailer Observations on 7/10/00</b>	<b>ISCO Pump Results on 7/14/00</b>	<b>Bailer Observations on 7/17/00</b>	<b>Bailer Observations on 7/21/00</b>
PZ-01 - SE001291	6/21/2000	53 ft downstream T116	0-.5	No indication of NAPL using oil/water interface probe.	Recovered 18 inches of water. Slight odor, no sheen or NAPL observed.	Recovered 300 mL, slight petrochemical odor. 3.6 ppm hdspc. No sheen.	Recovered 20.5 inches of water. No sheen or NAPL observed.	Slight sheen observed on purge water.
PZ-02	6/29/2000	25 ft downstream of T120 (east side)	0-2	No indication of NAPL using oil/water interface probe.	Recovered 0.56 inches of water. No sheen or NAPL observed.	No sample volume, piezometer is dry.	Recovered 21.5 inches of water. No sheen or NAPL observed.	Slight sheen observed on purge water.
PZ-03 - SE001306	6/21/2000	10 ft upstream T132	0-1	No indication of NAPL using oil/water interface probe.	11 inches of water in bailer. No sheen or NAPL observed.	No sample volume, piezometer is dry.	Recovered 26 inches of water. No sheen or NAPL observed.	No sheen in purge water.
PZ-04 - SE001281	6/21/2000	North side of Elm Street Bridge	0-.5	No indication of NAPL using oil/water interface probe.	Recovered 13.6 inches of water. No sheen or NAPL observed.	Recovered 1 L. Slight odor, no sheen, 3.1 ppm hdspc.	River washed piezometer downstream.	NA
PZ-05 - SE001299	6/21/2000	T124 (slightly upstream)	0-2	Oil/water interface probe became covered with coal tar, probe did not register an oil interval.	Coal tar smeared on outside of bailer. Coal tar too viscous to enter bailer. Recovered 10.75 inches of water.	Recovered 2.3 L. Strong distinct coal tar odor. Product coated inside of tubing and glass collection jar. 39 ppm hdspc. Sheen on water surface.	Recovered 25 inches of water. Coal tar odor, no visible sheen. Coal tar observed on outside tip of bailer.	Small amount of coal tar pumped from bottom of 2-inch piezometer. Tubing became clogged.
PZ-06 - SE001316	6/21/2000	Between T142 and T140	0-2	No indication of NAPL using oil/water interface probe.	Recovered 15 inches of water. No sheen or NAPL observed.	No sample volume, piezometer is dry.	Recovered 22 inches of water. No sheen or NAPL observed.	Sheen observed in purge water.

Notes: All depths are in feet below the riverbed unless otherwise specified. Locations are on the west side of the river unless otherwise specified.

NA = Not applicable

Table 2.2-5

**Summary of Sediment NAPL Results,  
Location SE001291**

Analyte Name	Units	Observed Conc.	MCP S-2 Conc.	Observed Conc. > MCP S-2 Conc.	OMEE LEL Conc.	Observed Conc. > OMEE LEL Conc.	OMEE SEL Conc.	Observed Conc. > OMEE SEL Conc.
4,4'-DDD	mg/kg	0.062	3					
4,4'-DDT	mg/kg	0.084	2					
KEPONE	mg/kg	0.18						
METHOXYCHLOR	mg/kg	0.25	30					
2-METHYLNAPHTHALENE	mg/kg	1200	1000	Exceeds				
ACENAPHTHENE	mg/kg	680	2500					
ACENAPHTHYLENE	mg/kg	940	1000					
ANILINE	mg/kg	1900						
ANTHRACENE	mg/kg	1100	2500		0.22	Exceeds	370	Exceeds
BENZO(A)ANTHRACENE	mg/kg	810	1	Exceeds	0.32	Exceeds	1480	
BENZO(A)PYRENE	mg/kg	640	0.7	Exceeds	0.37	Exceeds	1440	
BENZO(B)FLUORANTHENE	mg/kg	410	1	Exceeds				
BENZO(GHI)PERYLENE	mg/kg	230	2500		0.17	Exceeds	320	
BENZO(K)FLUORANTHENE	mg/kg	620	10	Exceeds	0.24	Exceeds	1340	
CHRYSENE	mg/kg	730	10	Exceeds	0.34	Exceeds	460	Exceeds
DIBENZO(A,H)ANTHRACENE	mg/kg	78			0.06	Exceeds	130	
DIBENZOFURAN	mg/kg	1200						
FLUORANTHENE	mg/kg	2000	1000	Exceeds	0.75	Exceeds	1020	Exceeds
FLOURENE	mg/kg	1300						
INDENO(1,2,3-C,D)PYRENE	mg/kg	220	1	Exceeds	0.2	Exceeds	320	
NAPHTHALENE	mg/kg	4300	1000	Exceeds				
PHENANTHRENE	mg/kg	3500	100	Exceeds	0.56	Exceeds	950	Exceeds
PYRENE	mg/kg	1700	2000		0.49	Exceeds	850	Exceeds
TCDF (TOTAL)	µg/kg	0.101						
TEQ 2,3,7,8-TCDD (EPA)	µg/kg	0.00725						
TEQ 2,3,7,8-TCDD (MADEP)	µg/kg	0.0102	0.006	Exceeds				
ANTIMONY	mg/kg	0.93	40					
ARSENIC	mg/kg	4.3	30		6		33	
BARIUM	mg/kg	19	2500					
BERYLLIUM	mg/kg	0.24	0.8					
CHROMIUM	mg/kg	9	2500		26		110	
COBALT	mg/kg	6.1						
COPPER	mg/kg	19.5			16	Exceeds	110	
LEAD	mg/kg	489	600		31	Exceeds	250	Exceeds
MERCURY	mg/kg	0.42	60		0.2	Exceeds	2	
NICKEL	mg/kg	9.7	700		16		75	
VANADIUM	mg/kg	7.4	2000					
ZINC	mg/kg	42.4	2500		120		820	
TOTAL PCB	mg/kg	5.4						

**Table 2.2-6****Summary of Aggrading Bar Sediment Data**

<b>Transects</b>	<b>Number of Samples</b>	<b>Maximum PCB Concentration (ppm)</b>	<b>Average PCB Concentration (ppm)</b>	<b>Percentage of Samples Exceeding Cleanup Goal of 1 ppm</b>	<b>95% UCL of the Average Conc.</b>
T162-T164	42	93.6	12.8	71%	45.3
T184	8	82.3	35.2	100%	73.9
T192	19	79.8	11.1	90%	26.5
T200-T202	17	537.0	86.9	100%	185.3
T208	24	141.0	24.9	75%	141 (M)
<b>All Aggrading Bars</b>	<b>110</b>	<b>537.0</b>	<b>28.2</b>	<b>82%</b>	<b>62.6</b>

Note:

"M" indicates the calculated 95% UCL exceeded the maximum value for the data set or there were fewer than three data points (the calculations require a minimum of three data points), and so the maximum value was substituted for the 95% UCL.

**Table 2.2-7****Summary of Subreach 4-4A Supplemental Sediment Data**

<b>Location</b>	<b>Transect</b>	<b>Subreach</b>	<b>Depth Interval (ft)</b>	<b>Total PCB Concentration (ppm)</b>
SD021521	T152	4-4A	2 - 3	14.2
SD021522	T152	4-4A	2 - 3	19.6
SD021523	T152	4-4A	2 - 3	37.1
SD021541	T154	4-4A	2 - 3	5.28
SD021542	T154	4-4A	2 - 2.5	7.53
SD021543	T154	4-4A	2 - 2.5	9.7
SD021561	T156	4-4A	2 - 2.5	13

Note: Depth intervals are in feet below the riverbed.

**Table 2.2-8**

**Summary of Non-Residential Deep Riverbank Soil Data**

<b>Depth Interval (ft below grade)</b>	<b>Number of Samples</b>	<b>Number of Samples Exceeding Cleanup Goal of 10 ppm</b>	<b>Average Total PCB Concentration (ppm)</b>
0.0 - 0.5	307	140	19.2
1.0 - 1.5	263	110	27.4
2.0 - 2.5	232	81	27.0
3.0 - 3.5	67	34	36.5
4.0 - 4.5	68	30	32.6
5.0 - 5.5	55	18	18.6
All Depths	992	413	25.3

Note:

Data for the 0.0- to 0.5-ft through 2.0- to 2.5-ft intervals are historical data presented for comparative purposes.



**Table 2.2-9****Summary of Riverbank Soils Data from Previously Unaccessed Areas**

<b>Subreach</b>	<b>Bank</b>	<b>Land Use</b>	<b>Number of Samples</b>	<b>Average PCB Concentration (ppm)</b>	<b>Maximum PCB Concentration (ppm)</b>	<b>95% UCL of the Average Conc.</b>
3-9	West	Recreational	18	83.8	421.0	190.6
3-10	West	Recreational	60	47.2	405.0	93.2
4-5B	East	Recreational	9	53.8	409.0	409 (M)
4-5B	East	Residential	9	26.2	111.0	24.7

Note:

"M" indicates the calculated 95% UCL exceeded the maximum value for the data set or there were fewer than three data points (the calculations require a minimum of three data points), and so the maximum value was substituted for the 95% UCL.

Table 2.2-10

## Summary Pore Water Quality Results

Transect ID Location ID Field Sample ID Date Collected Depth Source	MCP GW-3 criteria (mg/L)	NPDES Discharge Limits (mg/L)	GW000001 H2-GW000001-0-OU30 06/30/2000 0.0-0.0 EPA COE	GW000002 H2-GW000002-0-OL21 07/21/2000 0.0-0.0 EPA COE	GW000003 H2-GW000003-0-OU30 06/30/2000 0.0-0.0 EPA COE	GW000005 H2-GW000005-0-OL17 07/17/2000 0.0-0.0 EPA COE	GW000006 H2-GW000006-0-OL21 07/21/2000 0.0-0.0 EPA COE	GW000007 H2-GW000007-0-OU30 06/30/2000 0.0-0.0 EPA COE	GW000008 H2-GW000008-0-OU30 06/30/2000 0.0-0.0 EPA COE	GW000009 H2-GW000009-0-OU30 06/30/2000 0.0-0.0 EPA COE	GW000010 H2-GW000010-0-OL21 07/21/2000 0.0-0.0 EPA COE
Analyte											
1,2,4-TRICHLOROBENZENE (mg/L)	0.5	0.07	.011 U	.01 U	.00078 J	.012 U	.011 U	.011 U	.011 U	.012 U	.011 U
1,4-DICHLOROBENZENE (mg/L)	8	0.1	.01 U	.01 U	.01 U	.012 U	.011 U	.011 U	.012 U	.012 U	.00087 J
ACENAPHTHENE (mg/L)	5	none	.001 J	.01 U	.01 U	.012 U	.0013 J	.011 U	.011 U	.012 U	.011 U
BIS(2-ETHYLHEXYL) PHTHALATE (mg/L)	0.03	0.1	.011 U	.00094 J	.01 U	.012 U	.0014 J	.011 U	.00093 J	.00082 J	.0013 J
FLUORENE (mg/L)	3	none	.011 U	.01 U	.01 U	.012 U	.00063 J	.011 U	.011 U	.012 U	.011 U
PENTACHLOROBENZENE (mg/L)	none	0.1	.011 U	.0006 J	.01 U	.012 U	.011 U	.011 U	.011 U	.012 U	.011 U
1,2-DIBROMOETHANE (mg/L)	none	none	.0005 U	.00085	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U
1,4-DIOXANE (P-DIOXANE) (mg/L)	none	none	.025 R	.025 R	.025 R	.025 R	.025 R	.025 R	.025 R	.025 R	.025 R
2-BUTANONE (mg/L)	none	0.1	.0025 R	.0025 R	.0025 R	.0025 R	.0025 R	.0025 R	.0025 R	.0025 R	.0025 R
ACETONE (mg/L)	50	0.1	.021 J	.0025 R	.0045 J	.0007 J	.0058 J	.0042 J	.0043 J	.0044 J	.004 J
ACROLEIN (mg/L)	none	none	.0035 R	.0025 R	.0025 R	.0025 R	.0025 R	.0025 R	.0025 R	.0025 R	.0025 R
BENZENE (mg/L)	7	0.005	.0039 J	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U
CHLOROBENZENE (mg/L)	0.5	0.1	.0005 U	.0005 U	.0016	.0005 U	.0005 U	.0009	.0011	.0012	.0005 U
CHLOROMETHANE (mg/L)	none	none	.0005 U	.0005 U	.00057	.0005 U	.0005 U	.00051	.0005 U	.0005 U	.0005 U
ISOBUTANOL (mg/L)	none	none	.025 R	.025 R	.025 R	.025 R	.025 R	.025 R	.025 R	.025 R	.025 R
PROPANE NITRILE (PROPIONITRILE) (mg/L)	none	none	.002 R	.002 R	.002 R	.002 R	.002 R	.002 R	.002 R	.002 R	.002 R
TOLUENE (mg/L)	50	BTEX <0.1	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U	.0005 U	.0046 J
VINYL CHLORIDE (mg/L)	40	none	.0005 U	.0005 U	.00053 J	.0005 U	.0005 U	.0005 UJ	.0005 UJ	.0005 UJ	.0005 U
ALKALINITY (mg/L)	none	none	324	170	152	52.0	244	248	200	196	116
HARDNESS (mg/L)	none	none	348	220	200	57.0	230	305	220	210	110
ANTIMONY (mg/L)	0.3	none	.0046 U	.0044	.0058	.0043 U	.0043 U	.0049	.0046 U	.0046 U	.0043 U
ARSENIC (mg/L)	0.4	0.05	.0025 UJ	.0046 U	.0025 UJ	.0046 U	.0101	.0025 UJ	.0025 J	.0025 UJ	.0046 U
BARIUM (mg/L)	30	0.1	.059	.0314	.0264	.0161	.126	.0831	.0646	.065	.0382
BERYLLIUM (mg/L)	0.05	0.004	.00056	.0002 U	.0003 U	.0002 U	.00051	.00082	.00043	.00044	.00028
CADMIUM (mg/L)	0.01	none	.0003 U	.00043	.0003 U	.0004 U	.0004 U	.0003 U	.0003 U	.0003 U	.0004 U
CALCIUM (mg/L)	none	none	98.6	54.4	41.2	15.3	70	51.1	50.3	50.3	29.9
CHROMIUM (mg/L)	2	0.1	.0022 U	.0011 U	.0022 U	.0011 U	.0029 J	.0026	.0022 U	.0022 U	.0011 U
COPPER (mg/L)	none	0.1	.0038 J	.0019 U	.0058 J	.007 J	.0393	.0112 J	.0026 J	.0026 J	.0069
LEAD (mg/L)	0.03	0.05	.0023 U	.0037 U	.0023 U	.0047 U	.0071 U	.0208	.0033	.0037	.0051
MAGNESIUM (mg/L)	none	none	25.3	28	20.4	5.66	23.3	29.6	19.4	19.1	12
SELENIUM (mg/L)	0.08	none	.004 U	.0031 J	.004 U	.0027 U	.004 J	.004 UJ	.004 U	.004 U	.0027 U
THALLIUM (mg/L)	0.4	0.002	.0039 U	.0038 UJ	.0039 U	.0038 UJ	.0058 J	.0039 U	.0039 U	.0039 U	.0038 UJ
VANADIUM (mg/L)	2	0.1	.0029 U	.0022 UJ	.0029 U	.0022 U	.0048	.0029 U	.0029 U	.0029 U	.0022 UJ
ZINC (mg/L)	0.9	0.1	.0085	.0443	.0102	.0493	.0673	.0043	.0047	.0047	.0091
AROCLOR-1254 (mg/L)	0.0003	0.0005	.000014 U	.000088	.00032 U	.000052 J	.000014 J	.000039	.000016 U	.000015 U	.00012
AROCLOR-1260 (mg/L)	0.0003	0.0005	.000027	.00018	.0024	.00027	.000019 J	.000016	.00003	.000034	.00074
PCB, TOTAL (mg/L)	0.0003	0.0005	.000027	.00027	.0024	.00027 J	.000033 J	.0002	.00003	.000034	.00086

Notes: none - There is no listed standard for this particular compound.

U - Compound was not detected in the sample above the reported detection limit (see complete data set in Appendix B for detection limits)

J - Concentration stated represents an estimated value.

R - Result was rejected during data validation.

**Bold** - Indicates result exceeds one of the stated criteria.

Table 2.2-11

## Seepage Meter Summary

Seepage Meter ID	Location	Date/Time Sample Bag Installed	Date/Time Sample Bag Removed	Volume (gallons)	Groundwater Flux (gal/day)	Groundwater Recharge Rate (gpd/ft <sup>2</sup> )	Comments	Analytical Sample ID
SM01	Between T070 - T072	7/10/00 1005	7/10/00 1615	0.8	3.1	1.1	Sample collected on 6/30/00. Flux measured during separate sampling event.	H2-GW000001-0-0U30
SM02	Near T082	6/29/00 1405	6/30/00 0935	>2.0	>2.5 <sup>b</sup>	>0.9 <sup>b</sup>	Sample collected on 7/21/00. Several attempts to collect flux without success.	H2-GW000002-0-0L21
SM03	Near T100	6/29/00 1345	6/30/00 0950	>2.0	>2.5 <sup>b</sup>	>0.9 <sup>b</sup>	Sample collected on 6/30/00. Several attempts to collect flux without success.	H2-GW000003-0-0U30
SM04 <sup>a</sup>	Refusal							
SM05	Near T132	6/29/00 1040	6/30/00 0930	0.5	0.5	0.2	Sample collected on 7/17/00. Flux measured during separate sampling event.	H2-GW000005-0-0L17
SM06	Between T144 - T142	6/29/00 1010	6/30/00 0935	0.2	0.2	0.1	Sample collected on 7/21/00. Flux measured during separate sampling event.	H2-GW000006-0-0L21
SM07	Between T156 - T158	6/29/00 1000	6/30/00 1010	1.5	1.5	0.5	Sample collected on 6/30/00.	H2-GW000007-0-0U30
SM08	Between T178 - T176	6/29/00 0945	6/30/00 1020	1.6	1.6	0.6	Sample collected on 6/30/00.	H2-GW000008-0-0U30
SM09	Between T190 - T188	6/29/00 0935	6/30/00 1000	1.0	1.0	0.4	Sample collected on 6/30/00.	H2-GW000009-0-0U30
SM10	Between T208 - T210	6/29/00 0905	6/30/00 0953	0.2	0.2	0.1	Sample collected on 7/21/00. Flux measured during separate sampling event.	H2-GW000010-0-0L21

Notes:

<sup>a</sup> Unable to locate suitable area for seepage meter in cobble reach.<sup>b</sup> Several attempts were made to collect volume < 2.0 gallons for flux calculation. Flux value represents estimate only; the actual flux is greater than that shown.

Sample collection bag has 2-gallon capacity. Groundwater flux can be estimated only if bag is full when inspected.

**Table 3.2-1**

**Volume Estimate for Aggrading Bars**

<b>Bar ID</b>	<b>Subreach ID</b>	<b>Depth per EE/CA (ft)</b>	<b>Depth per Bar (ft)</b>	<b>Additional Depth (ft)</b>	<b>Volume (yd<sup>3</sup>)</b>
1338/1339	4-4B	3.0	6.0	3.0	166
1341/1342	4-4B	3.0	6.0	3.0	166
1343/1344	4-4B	3.0	6.0	3.0	166
1348/1349	4-6	2.5	6.0	3.5	203
1350/1351	4-5B	2.5	5.5	3.0	166
1353/1354	4-6	2.5	5.5	3.0	166
1355/1360	4-5B	2.5	6.0	3.5	203
1356/1357	4-6	2.5	5.5	3.0	166
1358/1359	4-6	3.5	6.0	2.5	131
1361/1362	4-6	2.5	6.0	3.5	203
1363/1364	4-6	2.5	4.5	2.0	100
<b>Total Additional Volume from Aggrading Bars</b>					<b>1,834</b>